



MLDS CENTER

Maryland Longitudinal
Data System

Better Data • Informed Choices • Improved Results

Who's Teaching STEM CTE?

STEM = Science, Technology,
Engineering, and Mathematics

CTE = Career and Technical Education

Dr. David Blazar
MLDS Research Branch
UMCP

Acknowledgement

- *This work was supported by the National Science Foundation DRL2101163. The work reflects the authors, not the granting agency.*
- *Collaborators: Michael Gottfried (University of Pennsylvania) and Jay Plasman (Ohio University)*

Background

- STEM CTE courses generally fall into 2 strands, with some additional grey areas
 - Information technology and engineering courses
 - Java programming, cyber security operations, certified entry network technician
 - Grey area: health and biosciences
- Courses serve as important scaffolding to move students through STEM pipeline for 3 reasons
 - An opportunity to reinforce skillsets learned in other classes (Bozick & Dalton, 2013; Shifrer & Callahan, 2010)
 - Learn how STEM is relevant to areas beyond the classroom (Stone & Lewis, 2012)
 - Develop new skills (Gottfried, Bozick & Srinivasan, 2014; National Research Council, 2011)

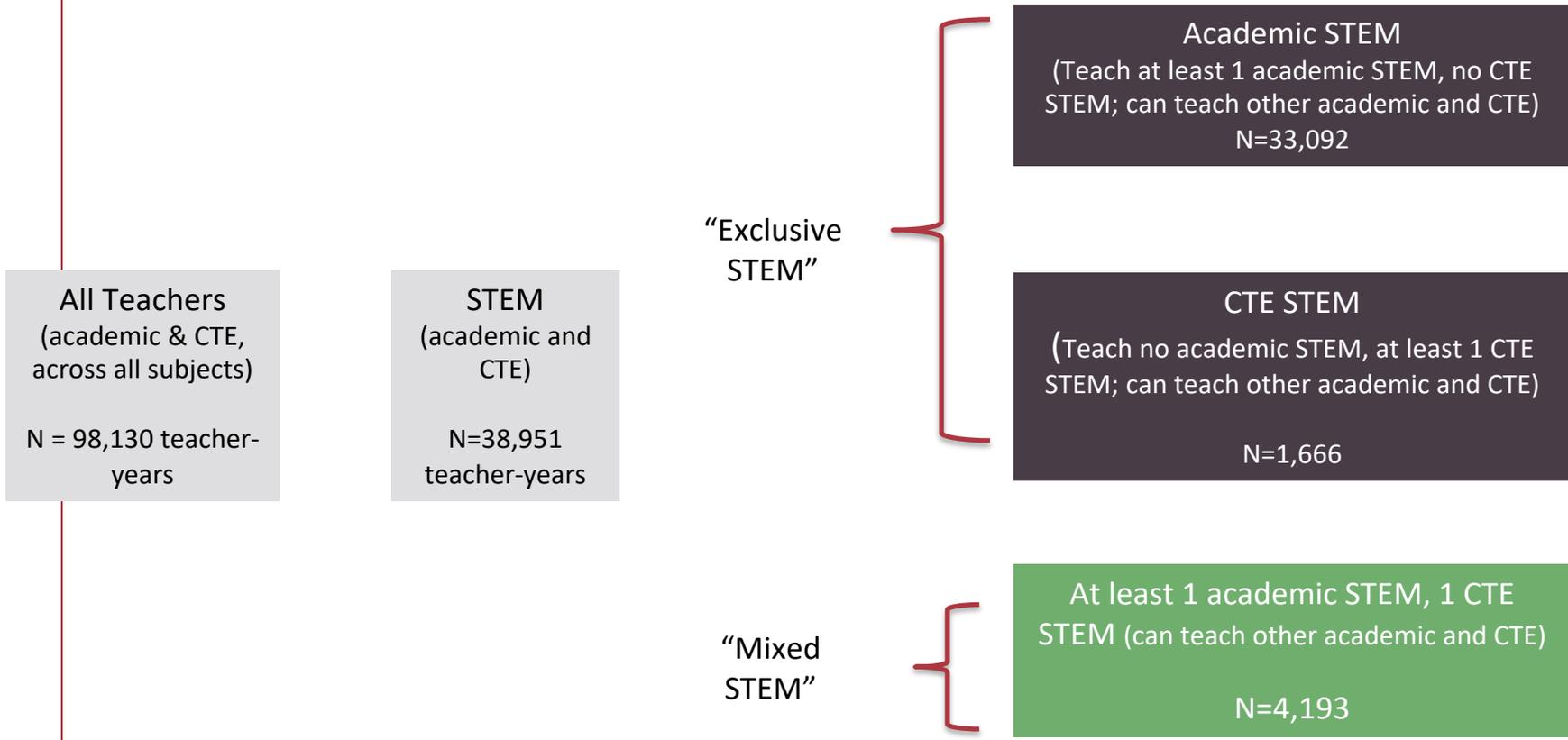
Guiding Questions

- Substantial evidence that teachers are key in-school resource for supporting student outcomes.
- However, minimal attention has been paid to STEM CTE teachers.
- We begin very descriptively:
 1. How can we create a taxonomy of STEM CTE teachers?
 2. What is their course load? Is it split between STEM and academic CTE?
 3. What are their characteristics?

Data and Sample from MLDS

- 2012-13 through 2017-18 school years
- Course data → identify and group teachers based on the classes they teach
- Staff data → capture demographics, years of experience, certifications

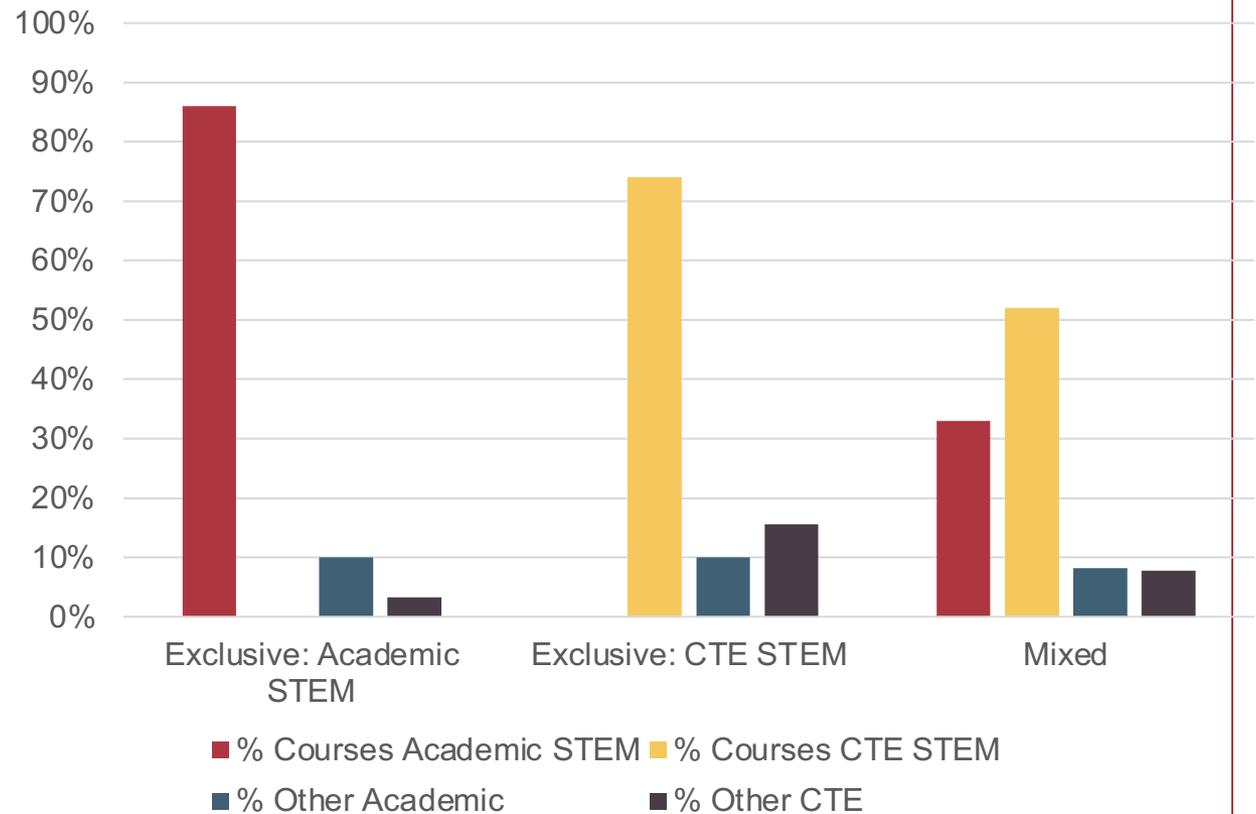
RQ1: Developing a Taxonomy



RQ2: Teaching Course Load

Key Takeaways

- 1. Exclusive academic STEM** teachers mostly teach academic STEM, and if not, other academic classes
- 2. Exclusive CTE STEM** teachers mostly teach CTE STEM, but higher rates of teaching other courses
- 3. Mixed STEM** teachers mostly teach CTE STEM, then academic STEM, then equally other types of classes





RQ3: Teacher Characteristics

	Exclusive Academic STEM	Exclusive CTE STEM	Mixed STEM
Novice	23%	23%	23%
Graduate Degree	74%	67%	70%
STEM Cert	74%	27%	68%
CTE Cert	1%	21%	6%
White	71%	66%	70%
Black	16%	30%	23%
Female	61%	59%	40%

Key Takeaways

1. **Experience and degrees** generally look similar across all 3 groups
2. **STEM Cert** more likely with those teaching academic STEM, **CTE Cert** more likely for exclusive CTE STEM
3. Larger share of **Black teachers** in STEM CTE than in academic STEM

Discussion and Next Steps

- STEM CTE teachers have **split course load**
 - Could be good for students if multi-pronged approach to STEM content supports high-quality teaching in both types of classes.
 - But, these teachers also could be spread too thin.
- STEM CTE teacher **characteristics** differ from larger teacher population
 - Much higher share of Black teachers may create more opportunities for teacher-student race-matching.
 - How much of this is due to local STEM and CTE labor markets and, in turn, STEM CTE offerings?
- Limitations: Limited set of characteristics on teachers. Ideally would like you know STEM industry experience.
- Next steps: Wrap in workforce data (where feasible); examine variation in course offerings across districts; connect teacher and course data to student outcomes

Thank you! And questions

David Blazar: dblazar@umd.edu